

The list of abbreviations given below is not comprehensive; these abbreviations may or may not be incorporated into the Contract Documents and abbreviations not listed may be used. Periods may or may not be shown after the abbreviation.

Abbreviations are given usually for the singular case - for the plural case, the same abbreviation without adding the 's' may be used.

While upper case letters are shown, either upper case or lower case letters may be used in Specifications.

The following is listed alphabetically by the complete word, not by the abbreviation.

by the abbreviation.

ABBREVIATION	COMPLETE WORD
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	
21	
22	
23	
24	
25	
26	
27	
28	
29	
30	
31	
32	
33	
34	
35	
36	
37	
38	
39	
40	
41	
42	
43	
44	
45	
46	
47	
48	
49	
50	
51	
52	
53	
54	
55	
56	
57	
58	
59	
60	
61	
62	
63	
64	
65	
66	
67	
68	
69	
70	
71	
72	
73	
74	
75	
76	
77	
78	
79	
80	
81	
82	
83	
84	
85	
86	
87	
88	
89	
90	
91	
92	
93	
94	
95	
96	
97	
98	
99	
100	

ASD Allowable Stress Design  
ALT Alternate  
ACI American Concrete Institute

American Concrete Institute  
American Institute of Steel Construction  
American Iron and Steel Institute  
American National Standards Institute  
American Society for Testing and Materials  
American Society of Civil Engineers  
American Welding Society  
And  
Angle  
Approximate  
Architectural  
At  
At x (length unit) on Center  
Back To Back  
Back-vent  
Beam  
Bearing  
Between  
Block (as for steel beams)  
Blocking  
Both Faces  
Both Sides  
Bottom  
Building  
Channel  
Camber  
Cantilever  
Cast-In-Place (Concrete)  
Ceiling  
Center  
Center Line  
Center of Gravity  
Center To Center  
Chamber  
Clearance  
Column  
Complete Joint Penetration (Weld)  
Concrete  
Concrete Masonry Unit  
Concrete Reinforcing Steel Institute  
Construction  
Construction(s)  
Construction Joint  
Continuous ex Concourse  
Control Joint  
Corrosion  
Cubic  
Cubic Foot  
Cubic Inch  
Cubic Yard  
Dead Load  
Deep, Depth  
Defect (encl)  
Degree  
Detail  
Diagonal  
Diameter  
Diaphragm  
Dimension  
Ditto  
Down  
Drawing  
Each  
Each Pace  
Each Way  
East (also Modulus of Elasticity)  
East-West  
Electric(al)  
Elevation  
Equal  
Equipment  
Equivalent  
Existing  
Expansion Joint  
Exterior  
Far  
Far Pace  
Far Side  
Figure  
Finish  
Finish  
Finish Floor  
Finish Grade  
Fireproofing  
Floor, Floor Line  
Foot  
Gage, Gauge  
Galvanized  
General  
Grade, Grading  
Height  
Hexagon(al)  
High  
High Point  
Horizontal  
Horizontal (Force)  
Inch  
Include(d), (ing)  
Inside Diameter  
Inside Face  
Interior  
Joint  
Kip  
Kip-Feet  
Kips per Linear Foot  
Kips per Square Foot  
Kips per Square Inch  
Knockout  
Length  
Light  
Lightweight  
Linear  
Live Load  
Load and Resistance Factor Design  
Long Legs Back to Back (for angles)  
Long-Slotted (Bolt Hole)  
Low Point  
Manufacturer  
Material  
Maximum  
Mechanic(al)  
Medium  
Member  
Meszanine  
Minimum  
Miscellaneous  
Miscellaneous Channel  
Modulus of Elasticity  
Moment

ABBREVIATION	COMPLETE WORD
NY	Near Face
NS	Near Side
NED	Negative
N	Nominal
NW	Normal Weight (concrete)
N	North
N-S	North-South
NIC	Not In Contract
NR	Not Reducible (Live Load)
NTS	Not To Scale
OC	Number
OC	On Center(s)
OPG	Opening
OPP	Opposite
OPS	Oversize (round bolt hole)
OD	Outside Diameter
OF	Outside Face
OL	Outstanding Leg
O TO O	Out To Out
PP	Partial Penetration Weld
PERM	Permanent
PERP, also a	Perpendicular
PC	Piece
PC MK	Piece Mark
PL	Plate
PT	Point
LE	Pounds
PCF	Pounds per Cubic Foot
PLF	Pounds per Linear Foot
PSF	Pounds per Square Foot
PST	Pounds per Square Inch
PRELIM	Preliminary
PROV	Provide (ision)
R	Radius
REF	Reference
REINF	Reinforce(d), (ing), (ment)
REBR	Reinforcing Bar
RELOC	Relocate
REQD	Required
REV	Reverse(d) (ion-s)
RD, also o	Revised
SCHED	Schedule(d)
SEC, also -	Second
SDCT	Section
SMT	Sheet
SLBB	Short Legs Back to Back
SSL	Short-Slotted (Bolt Hole)
SLM	Similar
SK	Sketch
SLOT	Slot(ted)
SO	South
SPDC	Specification(s)
SO FT, or FT <sup>2</sup>	Square
SO IN, or IN <sup>2</sup>	Square Inch
STAG	Stagger(ed)
STD	Stainless Steel
STST	Standard
STSL	Steel
STIFF	Stiffener
STRUCT	Structural
T	Superimposed Dead Load
TSYMT	Symmetry (ical)
TS	Tee Section
TSZ	Tube (Structural)
TEMP	Temperature
TEMP	Temperature
THK	Thick(ness)
THRU	Through
TOL	Tolerance
TOT	Top of Concrete
TSC	Top of Steel
TSS	Typical
TYP	Typical
ULT	Ultimate
UL	Underwriter's Laboratory, Inc.
UNX	Unless Otherwise Noted
VIP	Verify In Field
VERT	Vertical
VERT	Vertical (Reaction or Force)
WASH	Washer
WT	Weight
WSP	Welded Wire Fabric
W	West
W	Wide
W	Wide Plunge
W	Width
or WL	Wind Load
W	Wich
/O	Without
/O	Working (ing) Point
XKS	Double Extra Strong (Pipe)
S	Extra Strong (Pipe)
D	Yard
Y	Yield Stress (Steel)
Zee	Zee

## STRUCTURAL DESIGN CRITERIA

This structural design criteria of the project is for general information only and does not modify, alter or overrule the specifications or the Contract Drawings.

## A. CODES

The design meets or exceeds the requirements of the following codes. In some instances, the more stringent requirements have been applied where appropriate.

1. Building Code of the City of New York, 1993 and subsequent supplements.
2. Load and Resistance Factor Design Specification for Structural Buildings, 1 September 1986, with Supplement No. 1, 1 January 1989, (AISC-LRFD), by American Institute of Steel Construction.
3. ANSI/AWS D1.1, 1990, Structural Welding Code - Steel.
4. ACI 318-89, Building Code Requirements for Reinforced Concrete by American Concrete Institute.

### B. GRAVITY LOADS

The loads that follow do not include the weight of structural steel members. Normal weight concrete is taken at a unit weight of 150 pcf. Light weight concrete is taken at a unit weight of 117 pcf. Live loads are reducible except where noted NR (not reducible). The following are dead, superimposed dead and live loads taken for each occupancy category:

1. BULKHEAD FLOOR	psf	Notes
Construction Dead Load		
4" lightweight concrete slab over 2" metal deck	53	
Superimposed Dead Load		
- fireproofing	2	
- finish	2	
- equipment allowance	2	(1) (3)
Total Superimposed Dead Load	4	(1) (3)
Total Dead Load	57	(1) (3)
Live Load	75	NR (2)

## 2. BULKHEAD ROOF

Construction Dead Load		
- 1 1/2" roof metal deck	3	
Superimposed Dead Load		
- mechanical/electrical hung from below	10	(1)
- roof finish	20	
- 1 1/2" to 4" tapered insulation		
- waterproofing membrane		
1 1/2" pavers		
<b>Total Superimposed Dead Load</b>	<b>30</b>	<b>(1)</b>
<b>Total Dead Load</b>	<b>33</b>	<b>(1)</b>
<b>Live Load</b>	<b>40</b>	<b>NR</b>

### 3. FUEL OIL TANK ROOM ROOF

Construction Dead Load	
- 4 1/2" lightweight concrete slab over	
2" metal deck	58
Superimposed Dead Load	
- fireproofing	2
- mechanical/electrical hung from below	10
Total Superimposed Dead Load	<hr/> 12
Total Dead Load	70
Live Load	30

#### 4. BULKHEAD PERIMETER WALL.

A wall load of 20 psf (of wall surface area) is considered around the Bulkhead. The framing of the Bulkhead Floor and the framing of the Bulkhead Roof are each designed to carry the full weight of the perimeter wall. The intermediate tube beam is designed to carry a 10 psf wall load (of wall surface area) between the beam and the Bulkhead Roof.

## 5. 5 NTC FUEL OIL LINES

a) Vertical Runs

The weight of 2" fuel lines, weighing 6 pif each, between the 5 WTC Roof and the 299 Level, are considered to be supported at the 299 Level. Fuel lines are enclosed by 8" CSW walls inside the shaft, weighing 55 psf (of well surface area). Fuel pipe supports are provided at every floor.

## b) Horizontal Run

2) Two 2" fuel pipes inside an 8" SCH40 encasement pipe, all weighing 39 pif, are considered to be hung from the 5 WRC Roof (Floor 10), between the Generator Room and the riser shaft, at the 10th Level, between the riser shaft and the Fuel Tank Room.

Vertical supports for the fuel lines are assumed to be at approximately 10 to 12 ft. on center.

The fuel line is considered to be enclosed by a 2 hour fire rated gypsum board enclosure, weighing approximately 40 pif, directly attached to the structure.

## 6. ELECTRIC CABLES

### 3. ELECTRIC CABLES

a) **Vertical Runs**

Armored cables, weighing 16 plf each, inside 5" rigid conduits, weighing 13 plf each, are considered in the riser shafts at 5WTC, 2WTC and 1WTC. The number of cables are shown in the Contract Drawings. Per JPLA, the total weight of cable and conduit (29 plf) is assumed uniformly distributed between all conduit supports in the run. Conduits are supported at every floor.

4. Methodology -

b) Horizontal Run

Unless otherwise noted, cables, weighing 8 pif each, inside 5" rigid conduits, weighing 13 pif each, are considered to be hung from the existing structure. See Mechanical Drawings for routing of cables.

A 2" concrete encasement, weighing 85 pif for each conduit, is added where the encasement is indicated in the mechanical drawings. Vertical supports for the cables (and the encasement where required) are assumed to be at approximately 5 ft. oo center.

3. FUEL OIL TANK ROOM

7. FUEL OIL TANK ROOM

It is assumed that one tank may burst, causing the Tank Room to flood to a level of 2.8 ft. The CHW walls surrounding this room are capable of resisting the hydrostatic pressure associated with this flooding.

0501

- Actual equipment summarized as follows: maximum open-sheds, attached equipment in location of Generator Radiator Switchgear (2) Switchgear Load Bank Futura 5WCR
- 80% of the generators
  - 20% is the two 18"
- An 18" north-south supported if of the side
- Omit Live Note 1 Use between generators
- To facilitate the area east Columns Z-1 generators Z-1
- Note that the generators are rigging bearing the weight